

Department of the Treasury
Federal Law Enforcement Training Center
Cheltenham, Maryland

TRANSPORTATION
STUDY

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TRANSPORTATION

Existing Conditions

The site is located in southern Prince George's County, approximately 5 ½ miles south of the Capital Beltway (I-95), and a few miles south of Andrews Air Force Base. While direct access is provided off of County collector roadways, several State arterial highways surround the site. The primary access into the site is provided off of Dangerfield Road. Dangerfield Road provides a direct connection to MD 223 to the north and access to MD 5 to the west via Surratts Road. A secondary access is provided to Commo Road at the southeast corner of the facility. Commo Road provides access to US 301 to the east via Frank Tippet Road.

Each of the County roadways is a two-lane facility, connecting to State highways at signalized intersections. MD 5 is a six-lane divided highway connecting to I-95 and Washington, D.C to the north, and merging with US 301 to the south, providing access to southern Maryland. US 301 is a four-lane divided highway connecting with US 50 to the north, providing access to Upper Marlboro, Annapolis and other points north and east. MD 223 is a two-lane arterial that connects to MD 5 to the west and to MD 4 to the north.

Peak period traffic counts were conducted at seven (7) intersections between August 28th and September 20th, 2001. Existing traffic volumes are presented in Figures 1 & 2 for the AM and PM peak hours, respectively. The raw traffic data is included in the appendix. Capacity and level of service analyses were conducted at each location using the Critical Lane volume analysis technique, in accordance with Maryland State Highway Administration and Prince George's County criteria. The capacity analysis worksheets are also provided in the appendix. The seven intersections and resultant levels of service are provided in Table 1.

Table 1 – Existing Conditions

<u>Intersection</u>	AM Peak Hour		PM Peak Hour	
	LOS	v/c	LOS	v/c
MD 5 at Surratts Road	E	0.98	E	0.95
Surratts Road at Dangerfield Road	A	0.32	A	0.25
Dangerfield Road at Access Road	A	0.15	A	0.20
Dangerfield Road at MD 223	A	0.42	C	0.76
Frank Tippet Road at Commo Road	A	0.18	A	0.30
Frank Tippet Road at Surratts Road	A	0.46	A	0.44
Frank Tippet Road at US 301	B	0.64	D	0.88

LOS – Level of Service

v/c – Volume-to-Capacity Ratio

Level of Service is defined as a qualitative measure of the operating conditions at any given intersection. It is a function of a number of factors including volume, geometry and traffic control. From the viewpoint of the driver, lower volumes provide higher levels of service, while higher volumes provide a lower level of service. The factors for measuring levels of service vary depending upon whether the intersection is signalized or unsignalized, but generally correspond to the following criteria. **Level of Service of A** describes operations with very low average delays per vehicle, accommodating traffic

volumes up to 62% of capacity. **Level of Service of B** operations result in higher average delays, but progression remains very good. Traffic volumes under level of service of B cannot exceed 72% of capacity. **Level of Service of C** introduces still higher average delays that are becoming noticeable to the driver. Traffic volumes under level of service of C can be as high as 81% of capacity. Under **Level of Service of D**, the influence of congestion becomes more noticeable to the driver. The upper volume limit at level of service of D is approximately 91% of capacity. This is generally considered by most agencies as the highest acceptable level of service. The upper limit of **Level of Service of E** is defined as capacity and the resultant delays may be considered as unacceptable to many drivers. Traffic volumes at **Level of Service of F** exceed capacity, resulting in unacceptable delays for virtually all drivers traveling in the peak directions. The range of volume-to-capacity ratios for each level of service are summarized below:

Table 2 – Level of Service Criteria

Level of Service	Volume-to-Capacity Ratio
A	< 0.625
B	0.625 to 0.712
C	0.712 to 0.813
D	0.813 to 0.906
E	0.906 to 1.00
F	> 1.00

The Washington Metropolitan Area Transit Authority (WMATA), the Maryland Transit Administration (MTA) and Prince Georges County operation bus service in the county. WMATA operates one Metrobus line along MD 5, beginning at MD 223 and running north. The MTA operates two commuter bus routes from southern Maryland to Washington, D.C., but there are no stops within the study area. The County operates two bus lines that run through the study area. The first route operates between the Branch Avenue Metro Station and The Southern Maryland Medical Center on Surratts Road. The second route operates between the Branch Avenue Metro Station and a Park & Ride Lot in Clinton. This route runs through the intersection of MD 223 and Dangerfield Road. There are no bus routes that run on Dangerfield Road or adjacent to the site.

Background Conditions

Background conditions generally consider regional traffic growth along arterial highways, the volume of traffic expected to be generated by approved development proximate to the site, and the affect of State and local capital improvement projects.

Based on historical traffic trends, regional growth along MD 5, US 301 and MD 223 is expected to be between 2% and 2½% per year to the design year of 2006. For the purpose of this analysis, we have assumed a 2% annual growth rate on US 301 and a 2½% annual growth rate on MD 5 and MD 223. For background growth along all other routes, we have assumed a 1% annual growth rate. The Maryland-National Capital Park & Planning Commission provided land use data for several residential, retail and institutional developments that are expect to impact area roadways. These are shown in Table 3

below. Traffic volumes have been generated for each development and have been assigned to the roadway network as part of the Background conditions.

Table 3 – Background Development

Development	Land Use
Cheltenham Park	129 Detached Residential Units
Holloway Estates	60 Detached Residential Units
Transnational Law & Business University	900 Students
	250 Room Hotel/Conference Center
Piscataway Creek Estates	94 Detached Residential Units

In addition to traffic volume, Background conditions also take into account the affect that State and local capital improvement projects may have on traffic patterns and intersection capacity. A review of both the State's Consolidated Transportation Program (CTP) and Prince George's County Capital Improvement's Program (CIP) indicates only one project funded for design and construction within the study area. Beginning in the summer of 2002, the State Highway Administration is scheduled to improve northbound MD 5 from south of Surratts Road to south of MD 223, by lengthening the existing third northbound through lane. While it will certainly improve traffic operations and safety, it does not increase intersection capacity.

A further review of the CTP indicates two highway projects currently in the planning phase, neither of which is funded for design or construction. The MD 5 Corridor Study examined alternatives to widen MD 5 to a 6-lane expressway and to upgrade access controls from north of I-95 to US 301, including a grade-separated interchange at Surratts Road. While much of the corridor has been upgraded, work on the southern section, i.e., south of MD 223, is on hold pending funding for design and construction.

Two other studies are underway by the Maryland Transit Administration to examine the feasibility of transit improvements along MD 5 and US 301. Planning efforts are expected to continue through 2002 along US 301 and through 2005 along MD 5. Neither project is funded for design or construction.

Background traffic volumes are presented in Figures 3 & 4 for the AM and PM peak hours, respectively. Capacity and level of service analyses were conducted at each location using the Critical Lane volume analysis technique. The capacity analysis worksheets are provided in the appendix. The seven intersections and resultant levels of service are provided in Table 4.

Table 4 – Background Conditions

<u>Intersection</u>	AM Peak Hour		PM Peak Hour	
	LOS	v/c	LOS	V/c
MD 5 at Surratts Road	F	1.10	F	1.07
Surratts Road at Dangerfield Road	A	0.38	A	0.32
Dangerfield Road at Access Road	A	0.22	A	0.28
Dangerfield Road at MD 223	A	0.48	D	0.91
Frank Tippet Road at Commo Road	A	0.22	A	0.34
Frank Tippet Road at Surratts Road	A	0.50	A	0.51

60% via MD 5 from the north to MD 223 to Dangerfield Road
20% via MD 5 from the north to Surratts Road to Dangerfield Road
5% via MD 5 from the south to Surratts Road to Dangerfield Road
5% via MD 223 from the east to Dangerfield Road
5% via US 301 from the south to Frank Tippet Road to Commo Road
5% via US 301 from the north to Frank Tippet Road to Commo Road

Total traffic volumes are presented in Figures 5 & 6 for the AM and PM peak hours, respectively. Capacity and level of service analyses were conducted at each location using the Critical Lane volume analysis technique. The capacity analysis worksheets are provided in the appendix. The seven intersections and resultant levels of service are provided in Table 5.

Table 5 – Total Conditions

Intersection	AM Peak Hour		PM Peak Hour	
	LOS	v/c	LOS	V/c
MD 5 at Surratts Road	F	1.14	F	1.07
Surratts Road at Dangerfield Road	A	0.43	A	0.35
Dangerfield Road at Access Road	A	0.34	A	0.32
Dangerfield Road at MD 223	A	0.57	E	0.92
Frank Tippet Road at Commo Road	A	0.26	A	0.36
Frank Tippet Road at Surratts Road	A	0.50	A	0.52
Frank Tippet Road at US 301	C	0.72	E	0.98

LOS – Level of Service

v/c – Volume-to-Capacity Ratio

Summary

A comparison between Background and Total Conditions, i.e., Tables 4 & 5, illustrates the relative impact of site traffic at each of the critical intersections. While the volume-to-capacity ratios increase only slightly at each location, the increase is enough at two intersections to affect the level of service. At the intersection of MD 223 and Dangerfield Road, while the v/c ratio increases by only .01 during the afternoon peak, it is just enough to change the level of service from D to E. Likewise, at the intersection of US 301 and Frank Tippet Road, the v/c ratio increases by .01 during the morning peak, changing the level of service from B to C. The level of service during the PM peak is E under both Background and Total conditions, with no change in the v/c ratio.

With the exception of these two locations, plus MD 5 at Surratts Road, all other intersections operate at adequate levels of service, well below capacity. And while the level of service at MD 5 at Surratts Road is calculated as F under both Background and Total conditions, the impact of the site is minimal. When the State Highway Administration moves the MD 5 project into the construction program and upgrades this location to a grade-separated interchange, including a realignment of Surratts Road east of the intersection, it is possible that some of the site traffic would shift from MD 223 to Surratts Road. And although not specifically addressed in this analysis, all truck traffic and deliveries will be directed to use the Commo Road gate. These actions should provide enough relief to the MD 223 at Dangerfield Road intersection to mitigate the impact of site generated traffic.

Additional mitigation may be accomplished through employee carpooling, the establishment of van service to nearby Metrorail stations, and minor adjustments to the intersection at US 301 to better define the right turn movement from Frank Tippet Road.

It should also be noted, that until the Navy abandoned the site, there were as many as 353 personnel (116 military, 237 civilian) assigned to the facility, exactly the same number of personnel expected under the current proposal.

References:

- Discussions with the Maryland State Highway Administration's Project Planning Division concerning the status of the MD 5/Surratts Road interchange project.
- Correspondence with the Maryland-National Capital Park & Planning Commission regarding the status of approved background development.
- Discussions with the Federal Law Enforcement Training Center concerning the number of personnel expected to use the facility along with full-time staff.
- Maryland Department of Transportation's Consolidated Transportation Program (FY 2001 – 2006)
- Prince George's County Capital Improvement Program (FY 2001-2006)
- Prince George's County bus route & schedules
- Washington Metropolitan Area Transit Authority bus routes and schedules
- Maryland Transit Administration bus routes and schedules
- Final Environmental Impact Statement, MD Route 5 from north of I-95 to south of US 301, 1988
- Trip Generation – 6th Edition, Institute of Transportation Engineer's, 1997

Appendix A

Capacity Analysis Worksheets Traffic Count Data